Misclassification of Childhood Homicide on Death Certificates

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Abstract: Suspect classification of homicide deaths of Connecticut residents under 20 years of age was noted for 29 percent of cases examined. Misclassification was attributed to incomplete or erroneous information recorded on the death certificates, rather than errors in the designation of ICD-9 homicide codes. The results have important implications in the interpretation of vital statistics when homicide is listed as the cause of death and underscore the value of record linkage systems. (*Am J Public Health* 1990; 80:213–214.)

Introduction

The causes of death reported on death certificates represent important national, state, and local statistics that are used in epidemiologic research as well as the planning/evaluation of health service delivery.[1,2]

Unfortunately, accuracy of death certificates regarding the cause of death presents problems.[3] In particular, underrecording of childhood homicide is known to be a serious problem.[4] It is thought to occur for a variety of reasons including ascertainment difficulties,[5] reporter unwillingness to consider homicide as a diagnosis,[6] and misclassification of homicides as "accidents" or as "cause of death unknown."[7]

This report addresses a complementary issue: the overrecording of childhood homicides on vital statistics.

Methods

Death certificates for all reported homicides between 1980–85 among Connecticut residents 0–19 years of age (N = 166) were reviewed by the authors. Supplementary information available from the State's Chief Medical Examiner Office on circumstances leading to the death of subjects (i.e., police investigation reports, eyewitness accounts and hospital records, laboratory and autopsy reports) was examined for the 161 deaths which occurred within the state.

The manner of death recorded on the death certificate (unintentional injury, homicide, suicide, or undetermined) was evaluated for consistency with supplementary information obtained from files of the State's chief medical examiners office. Homicide is defined in the ICD-9 CM manual as "injuries inflicted by another persons with intent to injure or kill by any means."[8] This definition is consistent with the legal interpretation of criminal homicide, i.e., "lethal violence (unlawfully) inflicted by a second person (or persons) with the intent to do bodily harm."[9] Non-criminal homicide deaths (i.e., negligence, justifiable homicide),[9] by contrast, would be excluded by a strict application of the ICD definition.

Certificates attributing death to the intentional use of a firearm, stabbing with a sharp instrument, other physical assault, arson and the like, when corroborated with statements by the assailant(s) or other eyewitnesses, and/or information from medical records and police investigations were considered accurate. Typical examples would be: an adolescent's death due to firearm injury where review of the medical examiner's report and police investigation report an argument following alcohol and/or illegal drug use in the company of friends or an acquaintance; a victim under three years of age for which a sworn confession by a parent attributes death to assault by blunt force was considered an appropriate designation of homicide.

Death certificates for which supplementary information was at odds were judged suspect for the purposes of this study. Our decisions were based on whether the police investigation documented criminal intent to injure or kill.

A preliminary review of circumstances leading to the death of cases suggested six causes of death for which an application of the ICD-9-CM homicide definition might be suspect; negligent use of a motor-vehicle, (e.g., motor vehicle/pedestrian collisions, without evidence of intent to injure, but rather hit and run incidents where the legal transgression was leaving the scene of a crash without stopping to give aid), unintended discharge of a firearm, (e.g., play with firearms by children, resulting in the unintended discharge of the weapon), suicide, legal intervention, arson, and drowning (e.g., where intent to harm was not documented).

Results

For 47 of 161 deaths studied (29 percent), we judged the manner of death reported on death certificates not to conform to strict interpretation of the ICD definition of homicide when supplementary information was taken into account. These included: 16 deaths due to arson, 13 motor vehicle pedestrian or pedal cycle collisions, 11 unintentional discharge of a firearm, four legal interventions, two suicides, and one drowning.

Table 1 characterizes those 47 cases. Error (20 percent) was less common regarding cause of death among 15–19 year olds, and most common (65 percent) among 10–14 year olds.

In addition, slight differences were noted by the race and sex of victim. Cause of death was misclassified in 17 of 74 cases among Whites (23 percent) compared to 30 of 87 among others (34 percent). Twenty seven percent of male cases compared to 33 percent of female cases were misclassified.

Discussion

Consistent use of the ICD-9 definition of death was found to be problematic in our investigation. Excluding such deaths from rate calculations would yield a corrected homicide rate of 2.13 per 100,000 persons, a reduction of some 30 percent of the current reported annual homicide rate for this age group.

We recognize the subjective nature of our effort and that additional information on the cases reviewed here (e.g., the legal disposition of criminal charges in such matters) may shed further light on the circumstances of intent to injure.

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TABLE 1—Suspect Homicide Deaths by Sex and Age of Victims; Connecticut Residents 0–19 Years, 1980–85

		Male Suspect cases							Female Suspect cases					
Age (years)	All Cases	Hit and run unintended injury	Playing with gun	Legal intervention	Suicide	Drowning	Arson	All Cases	Hit and run unintended injury	Playing with gun	Legal intervention	Suicide	Drowning	Arson
0–4	11		1				1	13	1					2
5–9	7					1	2	6		1				1
10–14	16	3	2	1			2	10	2	2				5
15–19	66	5	3	3	2		1	32	2	2				2
Total	100	8	6	4	2	1	6	61	5	5				10

47 of 161/29%

Furthermore, we recognize that underrecording of childhood homicides (i.e., false-negative cases) likely exceeds the discrepancies noted here. Our analysis focused exclusively on deaths for which the designation of homicide as a cause of death was problematic (i.e., false-positive cases). Attention to the complementary issue (i.e., the designation of criminal homicide deaths as unintentional injury, death due to other causes or cause of death unknown) was beyond our current resources but remains an area requiring further attention.

Our study pointed out several instances of failure to identify the cause of death correctly in circumstances involving the unintended use of firearms (e.g., playing with guns), hit and run motor vehicle collisions, legal intervention by police officers, arson, suicide and drowning. Patterns of misclassification related to the age of victim and mode of injury were detected. However, we were unable to specify systematic biases in the way data were recorded. Misclassification apparently resulted from incomplete or erroneous information on death certificates, rather than errors of ICD-9 homicide coding. Death certificates used for medical examiner cases require listing the manner of death as "accident, homicide, suicide, or undetermined." Presumably, initial homicide determination on the part of the medical examiner when forwarded to the state health department was then "properly" assigned an ICD-9 homicide code.

The importance of maintaining procedures for updating medical examiner files with related information available from police and hospital sources as well as revising death certificates on the basis of supplementary information that may be received is pertinent here. Permanent misclassification of deaths as homicides become more likely as procedures for revising certificates are inconsistent. In several instances we noted incomplete police reports. In others, supplementary information was dated after the certification of death date.

Problems stem, as well, from deficiencies of the ICD-9 classification system which do not allow accurate coding of "hit and run" motor vehicle pedestrian collisions. Roughly one-fourth (27 percent) of misclassified cases (13 of 47) were situations of this type. The coding of such cases as homicide rather than negligent use of a motor vehicle implies criminal intent by drivers. Such certificates provide little information to injury control researchers regarding the true circumstances of the event. Of the 161 cases reviewed only one true vehicular homicide was noted.

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REFERENCES

1. Glasser JH: The quality and utility of death certificate data. Am J Public Heath 1981; 71:231–233.
2. Gittlesohn A, Senning J: Studies on the reliability of vital and health records. I. Comparison of cause of death and hospital records diagnoses. Am J Public Health 1979; 69:680–689.
3. Gittlesohn AM: On the distribution of underlying causes of death. Am J Public Health 1982; 72:133–140.
4. Jason, J, *et al*: Underrecording of infant homicide in the United States. Am J Public Health 1983; 73:195–197.
5. Knight B: Forensic problems in practice. IX. Infant deaths. Practitioner 1976; 217:444–448.
6. Zumwalt RE, Hirsh CS: Subtle fatal child abuse. Human Pathol 1980; 11:167–174.
7. Rosenberg ML, *et al*: Violence, homicide, and suicide. *In:* Amler RW, Dull HB (eds): Closing the Gap: The Burden of Unnecessary Illness. New York, Oxford University Press, 1987; 166.
8. Commission on Professional and Hospital Activities: Manual of the International Classification of Diseases, 9th Rev. Clinical Modification. Ann Arbor: The Commission, 1980; 1:1042.
9. Adelson L: The Pathology of Homicide. Springfield, IL: Charles C. Thomas, 1978; 6, 7.